DEVELOP AND TEST WORKING MODEL FOR PROBLEMATIC INTERNET USE

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Research Scholar

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Guide

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INTRODUCTION

The internet is a global computer network providing various information and communication facilities, consisting of interconnected networks using standardised communication protocols (English Oxford Living Dictionaries, 2023). The internet is served to interconnect laboratories engaged in government research, and since 1994, it has expanded to serve millions of users with a multitude of purposes in all parts of the world. The Internet continues to be the most democratic of all the mass media and as of October 2023, has more than 5.3 million users worldwide (Internet World Stats, 2023). Approximately 67.7 % of the world population is on the Internet today, an incredible growth compared to only 0.4% in 1995 (Internet World Stats, 2023). The Internet is the most cost-effective communication method in the world and is considered an innovation for understanding and exploring the world. It reduces the burden of human beings in acquiring knowledge from different sources, and it enhances communication, thereby making human functioning easy. Since the smartphone came into the picture, internet accessibility has become more accessible. Thus, the internet plays an inevitable role in human life, making it a part of the individual's self.

India has the second largest number of internet users in the world. India's estimated number of internet users is around 692 million (Internet World Stats, 2023). As internet use is increasing rapidly, the problems related to the internet have also grown proportionately. Researchers worldwide have shown that internet addiction is a global phenomenon, and its prevalence varies greatly from 0.3% to 38% depending on the population studied, the study's methodology and the diagnostic instrument used (Chakraborty et al., 2010).

Different epidemiological studies of internet addiction were conducted in different countries. In 2009 and 2006, two extensive epidemiological studies were conducted with the general population in Norway and the United States. The study conducted in Norway indicated the prevalence of internet addiction among 3,399 adults and used Young's diagnostic questionnaire for the investigation. The study indicated a prevalence of 5.2% in internet addiction (Bakken et al., 2009). In the U.S study conducted in 2006 with 2513 adults from all 50 states showed the prevalence of 0.7% of internet addiction (Aboujaoude et al., 2006). Research from China (Cao & Su., 2007), South Korea (Kim et al., 2006 & Park et al., 2008), Greece (Siomos et al., 2008), Norway (Johansson et al., 2004), and Iran (Ghassemzadeh et al., 2008) has found prevalence estimates ranging between 2% and 11% of internet addiction.

The prevalence studies in India showed that problematic or pathological internet use has a greater impact on the population. A prevalence study in Uttar Pradesh, among 1,150 students, showed that 0.7% were addicted to the Internet according to Young's criteria (Upadhyay et al., 2017). A study conducted in Maharashtra among 846 health professional undergraduates showed they had mild, moderate and severe addiction, i.e., 19.85%, 19.5% and 0.4%, respectively, according to Young's criteria (Gedam et al., 2017). Prevalence of internet addiction among adolescents, conducted at Rewa, Madhya Pradesh, showed that 32.9% of students had mild internet addiction, 16.3% moderate and 0.4% severe internet addiction (Goswami et al., 2018). Another study conducted at Ranchi among undergraduate students was found to have a prevalence of 13.33% of internet addiction (Nitu et al., 2017). These studies done in India demonstrate the existence and prevalence of problematic internet use in our society which is alarming.

Problematic internet use is characterized by an individual's inability to control their internet use, which in turn leads to feelings of distress and functional impairment of daily living activities (Shapiro et al, 2000). In 1996, psychologist K. Young became the first to publish a detailed case report on Problematic Internet Use (Young., 1996). Internet addiction is referred to in several different ways. The terms "Internet addiction disorder (IAD)," "Problematic Internet Use (PIU)," "Excessive Internet Use," "Compulsive Internet Use," "Pathological Internet Use," and "Computer Addiction" (Griffiths, 1998; Cash et al., 2012; Yan et al., 2014; Li et al., 2014) have all been used to refer to the same notion which means, that an individual gets involved in their online use to such an extent that they neglect their various areas of life. According to Young (1996), the criteria for internet addiction are preoccupation with being online, increasing time spent online, unsuccessful attempts to stop, irritability when cutting back use, and staying online longer than intended. Shapiro et al. (2003) defined problematic Internet use as maladaptive preoccupation with Internet use, experienced as irresistible use for periods longer than intended, significant distress or impairment resulting from the behaviour, and the absence of other Axis I pathology that might explain the behaviour, such as mania or hypomania.

The use of the internet has increased over the last few years, specifically among youth. In fact, younger internet users (i.e., between 18 and 24 years old) were more at risk of becoming internet addicts than older users (Young., 1998). Possible reasons for this are (a) students have huge blocks of unstructured time, (b) schools and universities provide free and unlimited access to the internet, (c) students from the ages of 18–22 years are for the first time away from parental control without anyone monitoring or censoring what they say or do online, (d) young students

experience new problems of adapting to university life and finding new friends, and often end up seeking a companionship using different applications of the internet, (e) students receive full encouragement from faculty and administrators in using the different internet applications, (f) adolescents are more trained to use the different applications of technological inventions and especially the internet, (g) students desire to escape university sources of stress resulting from their obligations to pass examinations, compose essays, and complete their degrees in the prescribed time with reasonable marks, and finally (h) students feel that university life is alienated from social activities, and when they finish their studies, the job market with all its uncertainties is a field where they must participate and succeed in finding employment (Young., 2004).

The researchers have explained that problematic internet use affects individual's overall lives in terms of increasing anxiety and depression and reduces the psychological well-being of the individual. According to a study conducted on college students in central India, internet addiction was significantly negatively correlated to psychological well-being in the sub-dimensions of autonomy, environmental mastery, personal growth, positive relations, purpose in life, and self-acceptance (Sharma & Sharma., 2018). Their physical and mental health are also affected negatively (Upadhyay et al., 2017). Internet addiction is associated with anxiety, depression, loss of emotional/ behavioural control, emotional ties, life satisfaction, psychological distress, and lower psychological well-being (Gedam et al., 2017).

The predictors of problematic internet use are biological predispositions, individual attributes, and psycho-social and emotional characteristics, which

predetermine addictive behaviour in all other addictions. Another study shows that internet-addictive individuals share impulsivity, working memory and executive dysfunction with alcohol-dependent patients (Zhou., 2014). Another study indicates the similarity between individuals with internet addiction disorder and pathological gambling patients, who have deficiencies in working memory, executive dysfunction, and impulsivity the same study also indicated that individuals with internet addiction are more impulsive than pathological gambling patients (Zhou., 2015). Explorative studies have focused on the theoretical understanding of problematic internet use. However, some studies are based on the conceptual model for problematic internet use, and just a few are on the theoretical model.

The theoretical models introduced by Brand et al. (2016) and Dong and Potenza (2014) are the first steps in describing the potential mechanisms underlying the development and maintenance of Internet addiction. Based on the research by Brand et al (2016), several predisposing variables and vulnerability factors have been identified. These comprise psychopathological symptoms, such as depression and social anxiety, and personality variables, such as impulsivity and self-esteem. Social cognitions, like perceived social support, stress vulnerability, and genetic vulnerabilities, are further potential predisposing variables. It is argued that predisposing variables act in concert with moderating and mediating variables in the development and maintenance of an Internet addiction. Dysfunctional coping style and Internet use expectancies are considered important in this context. In the course of reinforcement learning and conditioning processes, cue reactivity and craving is supposed to develop, which may interact with reduced executive functioning and inhibitory control.

A theoretical model of internet addiction is developed based on the structural equation modelling known as the Socio-Emotional Model of internet addiction (Savcia and Aysan., 2017). According to this model, willingness to self-censor and being unable to do self-monitoring causes social anxiety, and this increases the negative effect on the individual. Negative affection causes internet addiction through daily Internet use duration, and both negative affection and daily internet use duration directly affect internet addiction.

A cognitive behavioural model of pathological internet use was developed by Davis (2001), indicating that maladaptive cognitions play a crucial role in both the development and maintenance of pathological internet use. A vicious cycle of cognitive distortions and reinforcement facilitates symptoms of pathological internet use and the negative behaviours associated with spending too much time online.

The person-Affect-Cognition-Execution (I-PACE) model was developed by Brand et al. in 2017. This model assumes that certain personality factors (e.g., shyness, low self-esteem), psychopathological symptoms (e.g., social anxiety, depression), and social cognitions (e.g., low perceived social support and loneliness) are predisposing factors for the development of generalised internet addiction. As mediating variables, a dysfunctional coping style (e.g., disengagement and conflict avoidance) and Internet use expectancies (e.g., the expectancy that social networking sites and other internet applications can be useful for avoiding problems in real life or for escaping from reality and for regulating negative mood) have been suggested. If the Internet (or various Internet applications) is then used as a type of dysfunctional coping with everyday life requirements (Kardefelt-Winther., 2014), the dysfunctional coping style and the internet use expectancies are reinforced. This model of generalised internet

addiction has been tested empirically with a nonclinical sample, and it was indeed shown that the effect of personality, psychopathological symptoms, and social aspects are fully mediated by a dysfunctional coping style and Internet use expectancies (Brand et al., 2014).

Research in the field of problematic internet use started at the end of the 20th century, and it still requires more empirical data in terms of developing theoretical models focusing on understanding and predicting behaviours associated with problematic internet use. Prevalence studies and explorative studies based on psychological variables were the prime focus in the majority of studies conducted in the recent past. In the current scenario, more research must be focused on theoretical understanding, which leads to developing interventions for problematic internet use. Since it affects personal, social, and psychological functioning, the condition is considered a psychosocial problem. However, the psychosocial aspect of the problem was not given much priority in research. According to the current knowledge, the models developed primarily focus on individual variables such as personality and cognition rather than on social and family factors. In the Indian context, studies have not been conducted that consider the combination of neuropsychological, psychological, social, and family factors. The current study will be focused on exploring neuropsychological, personal, social, emotional, and family factors associated with problematic internet use and developing a theoretical model based on structural equation modelling. This will help to focus on to the existing diagnostic system for a better understanding of the problem and plan the interventions effectively.

METHOD

Aim

To study the relationship pattern between Psycho Social Factors and Executive Functions associated with Problematic Internet Use among Youth and develop a working model to explain it.

Objectives

The objectives evolved based on the aim of the study are as follows.

1. To identify and assess the Psychosocial factors, Executive functions, and Problematic Internet use among youth.
2. To identify the relationship between Psychosocial factors, Executive functions, and Problematic Internet Use among youth
3. To determine the predictors of Problematic Internet Use among youth
4. To develop and test the Structural Equation Model on Problematic Internet Use among youth.

Hypotheses

The following hypotheses were formulated to meet the above objectives.

1. There will be a significant relationship between Psychosocial factors, Executive functions and Problematic Internet Use among youth.
2. Psychosocial factors and Executive functions will significantly predict problematic internet use among youth.
3. The Structural Equation Model will explain the Problematic Internet Use among youth.

Variables

Depression: The depression subscale assesses symptoms such as dysphoria, hopelessness, self-worthlessness, and lack of interest (Lovibond & Lovibond, 1995).

Anxiety: The anxiety scale contains items that assess somatic symptoms, situational anxiety, and subjective experience of anxious affect (Lovibond & Lovibond, 1995).

Stress: The stress scale assesses a condition of persistent arousal and tension consisting of symptoms such as difficulty in relaxing, agitation, irritability, and impatience (Lovibond & Lovibond, 1995).

Perceived Social Support from Significant other: Refers to an individual's subjective evaluation or perception of the availability, accessibility, and quality of support received from a particular person other than friends or family in times of need (Zimet et al., 1988).

Perceived Social Support from Friends: Refers to an individual's subjective evaluation or perception of the availability, accessibility, and quality of support received from friends in times of need (Zimet et al., 1988).

Perceived Social Support from Family: Refers to an individual's subjective evaluation or perception of the availability, accessibility, and quality of support their immediate family members receive (Zimet et al., 1988).

Social Connectedness: Social Connectedness is how people feel connected to others in their surrounding social area (Lee et al., 2008).

Perceived Authoritarian Parenting from Mother: Mothers who are strict, demanding, and controlling behaviour and they enforce rules with little flexibility or explanation. They prioritize obedience and conformity often using punishment as means of discipline (Buri J.R., 1991).

Perceived Authoritative Parenting from Mother: Mothers who are highly responsive and nurturing towards their children while also setting clear and reasonable expectations. Authoritative parents are warm, supportive and democratic in their approach (Buri J.R., 1991)

Perceived Permissiveness Parenting from Mother: Mothers who are more hands off approach and are lenient in setting rules and boundaries. Indulgent, allowing their children to have few repercussions for their actions (Buri J.R., 1991)

Perceived Authoritarian Parenting from Father: Fathers who are strict, demanding, and controlling behaviour and they enforce rules with little flexibility or explanation. They prioritise obedience and conformity, often using punishment as a means of discipline (Buri J.R., 1991)

Perceived Authoritative Parenting from Father: Fathers who are highly responsive and nurturing towards their children while setting clear and reasonable expectations. Authoritative parents are warm, supportive and democratic in their approach (Buri J.R., 1991)

Perceived Permissive Parenting from Father: Fathers who are more hands-off approach and are lenient in setting rules and boundaries. Indulgent, allowing their children to have few repercussions for their actions (Buri J.R., 1991)

Self Esteem: Self-esteem is one's positive or negative attitude toward oneself and overall evaluation of one's thoughts and feelings in relation to oneself (Rosenberg. 1965).

Loneliness: Loneliness is characterised as the phenomenon of feeling lonely as a specific experience of an unpleasant nature, the cause of which lies in quantitative or qualitative impoverishment of individuals' social relations; they also understand the

feeling of loneliness as a discrepancy between desired and actual social relationships (Russell et al., 1996).

Executive functions: Executive functions encompass the higher-order cognitive processes that enable individuals to adaptively manage their mental and behavioural activities. These functions include cognitive flexibility, which involves switching between tasks and approaches; working memory, allowing the manipulation of information; and inhibitory control, which aids in overriding automatic responses, thus facilitating goal-directed behaviour and effective problem-solving. The present study includes verbal working memory, sustained attention, cognitive control and verbal fluency.

Cognitive Reappraisal: Cognitive reappraisal is an antecedent-focused emotion regulation strategy occurring in the early stages of the emotional process; it successfully changes emotional experiences through the reinterpretation of emotional events (Gross, 1998).

Expressive Suppression: Expressive suppression is a response-focused emotion regulation strategy that occurs in the late stages of the emotional process by suppressing emotional activities (such as facial expressions) that will happen or are currently transpiring (Gross, 1998).

Cognitive Behavioural Avoidance: Cognitive behavioural avoidance refers to a psychological process where individuals intentionally or unconsciously avoid situations, thoughts or feelings that cause anxiety, fear or distress. It is a strategy to cope with perceived threats or uncomfortable emotions by avoiding them altogether. This avoidance can be in the form of behavioural and cognitive avoidance. In behavioural avoidance, the person avoids certain places, activities or situations that

create distress or anxiety. Cognitive avoidance means distracting oneself from distressing thoughts or suppressing emotions. Based on the avoidance in social or non-social situations, this avoidance becomes cognitive, social avoidance, cognitive non-social avoidance, behavioural social and behavioural non-social avoidance (Ottenbriet et al. (2014).

Problematic Internet Use: Problematic internet use is characterised by an individual's inability to control their internet use, leading to distress and functional impairment of daily activities (Shapira et al., 2000).

The Sample

The population of the present study is youth. The study sample consisted of 500 internet users, including both genders, age range between 16 to 24 years, chosen from the southern districts (Kottayam, Kollam, Pathanamthitta and Ernakulam) of Kerala. The sample size was calculated using William G Cochran's formula for infinite population.

Sample Size $\boldsymbol{n_0} = \frac{\boldsymbol{z^2 PQ}}{\boldsymbol{e^2}}$

$\boldsymbol{n_0}$=Sample size

Z value found in the Z table at a given confidence interval (1.96)

P is an estimated proportion of an attribute that is present in the population (0.05)

Q=1-P (0.05)

e is the margin of error (desired level of precision) (.05)

Based on this formula, the minimum sample size was estimated to be 384.

Table 1

Socio-demographic Characteristics of the Sample

Variable	Categories	N	Percentage
Age	16-24	500	100%
Gender	Male	231	53.60%
	Female	268	46.40%
Education	School	129	25.80%
	College	371	74.20%
Economic Status	Low	32	6.40%
	Middle	434	86.80%
	High	34	6.80%
Occupation	Working	58	11.60%
	Student	442	88.40%
Family Status	Nuclear	375	75%
	Joint	125	25%
Marital Status	Unmarried	484	96.80%
	Married	15	3.20%
Place of Residence	Rural	268	53.60%
	Urban	231	46.40%

The table represents the split up of the sample based on age, gender, education, economic status, occupation, family status, marital status, and place of residence. The table shows that 100% of the samples were collected from the age range of 16-24. Among them, 53.6% are males and 46.4% are females. 25.8% are school-educated,

and 74.2% are college-educated based on the education of the participants. From the table, it also can be seen that 6.4% belong to low socioeconomic status, 86.8% belong to middle socioeconomic status, and 6.8% are in high socioeconomic status. The 11.6% of the total sample are working, and 88.4% are students. Considering the family status of the participants, 75% of the sample belong to the nuclear family, and 25 are from the joint family system. The participants' marital status includes 96.8% of the total sample, who are unmarried, and the rest of the 3.2% are married. It may be seen from the table that 56.6% of the sample are from rural areas, and 46.4% are from urban areas.

Inclusion Criteria

The inclusion criteria of the sample are given below.

1. Participants must belong to the youth population between 16 and 25.
2. Participants must have at least one year of internet usage experience.
3. Participants must have attained a minimum education level of X standard.
4. Participants should demonstrate proficiency in the English language.

Exclusion Criteria

The following are the exclusion criteria kept for the present study sample;

1. Individuals with severe co-morbid psychiatric disorders such as psychoses, bipolar affective disorder (BPAD), recurrent depressive disorder (RDD), etc., were excluded from the study.
2. Individuals with a history of head injury, epilepsy, or any other neurological disorder and those with mental retardation were excluded.
3. Individuals currently dependent on psychoactive substances were excluded from participation.

4. Individuals undergoing treatment for serious physical illnesses such as cancer, tuberculosis, diabetes, hypertension, and other similar conditions will not be considered for the study.

Research Design

The research design employed for this study is primarily exploratory, with a specific focus on developing a theoretical model. The study utilises structural equation modelling (SEM) as the analytical framework to achieve this objective. The overarching goal is to construct a comprehensive theoretical model that can provide valuable insights into the complex relationships among various psychosocial factors, executive functions, and problematic internet use among young adults. The chosen research design can be categorised as descriptive in its approach. Overall, this research design, which combines exploratory and descriptive elements with correlation, stepwise regression, and structural equation modelling, is well-suited to address the study's objectives by providing a structured and empirically grounded approach to model development and analysis.

Test Materials

The following test materials were used to carry out the study.

Socio-Demographic Clinical Data Sheet (SDCDS)

This data sheet is used to obtain the socio-demographic details of the participant's age, education, occupation, socioeconomic status, gender, marital status etc.

Internet use Pattern Checklist

Internet use pattern checklist was developed by the researcher. This includes the number of years using the internet, internet use hours per day, internet use per week, the main purpose of internet use, and the primary method of internet use.

Stroop Test (Rao et al., 2004)

This test is used to assess the response inhibition. 4 words, RED, BLUE, YELLOW and GREEN are randomly printed on a sheet of paper. The sheet has 11 columns, and each column has 16 words. The words are printed other than the colour said by word. The first subject is asked to read all the words and then again to name the colour, ignoring the word. The time taken is noted for both conditions, and the time taken for reading is subtracted from the time taken for naming colours. The difference between the two scores makes the score for this test.

Verbal N back Test (Smith & Jonides., 1999)

This is a test of verbal working memory. The subject is presented with a list of sounds verbally, and the subject is instructed to tap if any sound is repeated after n number of sounds. The test has 1 back and 2 back conditions. The number of targets hit correctly and errors in both conditions separately make the scores.

Animal Names test (Lezak, 1995)

Animal names test measures category fluency. The number of words generated from the semantic category of Animals in one minute is noted. This number forms the score of the test.

Instrument for the Assessment of Internet Use (Tamilselvan & Sharma, 2019)

Instrument for Internet Use Assessment is a Likert-type scale developed by Tamilselvan and Manoj Kumar Sharma in 2019. According to the scale, the total score

between 0-18 indicates Recreational use of the internet, 19-36 is Excessive use, and 37-54 is dysfunctional internet use. The scale reported the Cronbach alpha of 0.893 indicates high internal consistency. The adapted version of the scale has the Chronbach alpha of .868.

Rosenberg's self-esteem scale (Rosenberg., 1969)

The Rosenberg Self-Esteem Scale was developed by Rosenberg (1965). The scale consists of a 10-question range that is presented with four response choices. The subject had to place a tick in the appropriate box to say whether he/she strongly agree, agree, disagree or strongly disagree. Rosenberg (1969) reported internal consistency reliability ranging from .85 to .88 for the college sample. The construct validity was found to be .72. The adapted version has Cronbach's alpha of .890.

Emotion Regulation Questionnaire (ERQ) (Gross & John.,2003)

The Emotion regulation questionnaire has been prepared by Gross and John (2003). It consists of 10 items under two subscales: reappraisal (6 items) and suppression (4 items). Responses are based on a 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7). The minimum score in the questionnaire will be 10, and the maximum will be 70. Obtaining higher scores in the reappraisal indicates a high level of reappraisal as a positive emotion regulation strategy in participants, and obtaining a lower score in suppression indicates lower levels of suppression as a negative emotion regulation strategy in participants and vice versa. The alpha reliabilities averaged .79 for cognitive reappraisal and .73 for Suppression. Test–retest reliability across three months was .69 for both scales. The adapted version has Cronbach’s alpha of .640.

Cognitive Behavioural Avoidance Scale (CBAS) (Ottenbreit & Dobson., 2004)

The Cognitive-Behavioral Avoidance Scale is a self-report measure to assess multiple dimensions of trait-level avoidance. The scale includes 31 items rated on a 1-5 Likert scale, comprising four subscales of avoidance: Behavioral Social, Cognitive Social, Behavioral Nonsocial, and Cognitive Nonsocial avoidance. Subscales demonstrate adequate to strong coefficient alphas (α = 0.86, 0.78, 0.75, 0.80, respectively) and test-retest reliability (r = 0.86, 0.58, 0.88, 0.94, respectively). A total avoidance score can also be calculated, with excellent internal consistency (α = .91) and test-retest reliability (0.92). Cronbach's alpha of the adapted scale version shows a good reliability of .972.

UCLA Loneliness Scale (Russell., Peplau., and Ferguson.,1996)

It is a 20-item scale that measures one's subjective feelings of loneliness and social isolationn. Participants will rate each item on a scale of 1 (Never) to 4 (Often). The measure has high internal consistency (coefficient alpha = .96) and a test-retest correlation over two months of .73. The adapted version has the reliability coefficient. Chronbach's alpha is .950.

The Depression, Anxiety and Stress Scale-21 (DASS-21)

The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. The three DASS-21 scales contain 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, and lack of interest/involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is

sensitive to levels of chronic nonspecific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable / over-reactive and impatient. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items. The Cronbach's alpha of the adapted version is .905.

Multidimensional Scale of Perceived Social Support (Zimet et al., 1988)

The Multidimensional Scale of Perceived Social Support (MSPSS) is a brief research tool designed to measure perceptions of support from 3 sources: Family, Friends, and a Significant Other. The scale is comprised of a total of 12 items, with four items for each subscale. Cronbach's coefficient alpha was obtained for the scale as a whole and each subscale. For the Significant Other, Family, and Friends subscales, the values were .91, .87, and .85, respectively. The reliability of the total scale was .88.The adapted version of the test has Cronbach's alpha of .943.

The social connectedness scale (Lee et al.; 1995)

The social connectedness scale assesses the degree to which youth feel connected to others in their social environment. The scale consists of 20 items, and the responses to the scale range from 1 (strongly disagree) to 6 (strongly agree). The higher score indicates more connectedness to others. The internal consistency reliability is .92. The adapted version has Cronbach's alpha of .653.

Parenting Authority Questionnaire (PAQ) (Buri.,1991)

This test assesses retrospective appraisals of parenting style. PAQ consists of 30 statements that reflect Baumrind's permissive, authoritarian, and authoritative parental authority prototypes. This is a self-administering screening test. Each statement on the PAQ is rated independently by the mother and father for 60 responses on a five-point scale. The participants are instructed to rate the

items on a five-point scale (one “strongly disagree” to five “strongly agree”) based on how well it applied to their relationship with their parental figure during the years that they were living at home. The Cronbach’s coefficient alpha values ranged from 0.74 (permissive father) to 0.87 (authoritarian father). In the present study, the PAQ was used to identify the perceived parenting style of the participants. The Cronbach’s alpha for the adapted version of the parental authority questionnaire for the father is .745, and for the mother, it is .633.

Procedure for Data Collection

The study's sample consists of 500 young individuals aged 16 to 24 who have been using the internet for at least one year. The data collection process employed a purposive sampling method guided by predefined inclusion and exclusion criteria. This approach involved selecting participants who were easily accessible and fell within the specified age range. The researcher maintained a rigorous ethical framework, clearly communicating the study's purpose to each participant and securing written consent while ensuring the participants comprehended their rights and obligations. Subsequently, participants were provided with socio-demographic data sheets, internet use pattern checklists, and various questionnaires. The researcher offered guidance and clarification as necessary without unduly influencing responses. After 30-minute breaks, neuropsychological tests were administered. Throughout the data collection process, the researcher monitored progress, ensuring all targeted participants responded, addressing missing or incomplete data, and trying to recover the necessary information. The collected data was securely transferred to a computer system to prepare for in-depth analysis, with meticulous attention to data entry accuracy.

Ethical Consideration

Ethical committee approval was obtained from the research institution before data collection, demonstrating the researcher's commitment to ethical guidelines. According to the Ethics Code of the American Psychological Association (2002), informed consent is used for research purposes to let the participants inform the purpose of the research, procedures, and the right to withdraw from the research once the participation has begun or to decline the participation and finally to whom should the participant contact for questions about research and participant's rights. Informed consent was also sought from the parents of those who are below 18 years of age who participated in the study.

Statistical Analysis

Statistical analysis for this study utilised IBM SPSS version 17 and AMOS. Several statistical approaches were employed to examine the data comprehensively. W. G Cochran’s sample size calculation formula for infinite population was used to estimate the sample size of the present study. The Anderson-Darling normality test assessed data normality, determining whether the dataset conformed to the multivariate normal distribution. The test yielded a p-value indicating the degree of fit with the assumed distribution. Secondly, Pearson's product-moment correlation coefficient was utilised to gauge linear relationships between variables, with positive, negative, or zero values indicating the direction and strength of correlations. Specifically, it was applied to explore the associations between problematic internet use and executive functions, psychological, social, and family factors. Thirdly, stepwise regression analysis was employed to identify significant contributors to problematic internet use among young adults, systematically selecting and eliminating

independent variables based on their significance level. Lastly, structural equation modelling was utilised to construct a comprehensive theoretical model of problematic internet use, examining causal relationships and latent variables and assessing direct and indirect effects. Descriptive statistics were also employed to gain insights into data characteristics.

RESULTS

H_1: There will be a significant relationship between psychosocial factors, executive functions, and problematic internet use among youth.

Table 2

Relationship between various psycho-social factors, executive functions and problematic internet use.

Sl.No	Variables	N	M	SD	Problematic Internet Use
1	Stress	500	6.73	4.52	0.263**
2	Anxiety	500	4.61	3.49	0.210**
3	Depression	500	5.89	4.26	0.268**
4	Support from Significant Other	500	16.5540	6.72	0.03
5	Support from Family	500	17.58	6.90	0.04
6	Support from Friends	500	17.7740	6.74	0.045
7	Social Connectedness	500	64.2200	10.41	0.082
8	Authoritative Mother	500	30.6480	8.29	-0.213*
9	Authoritarian Mother	500	29.5920	8.30	0.221**
10	Permissive Mother	500	27.0740	7.81	0.01

Sl.No	Variables	N	M	SD	Problematic Internet Use
11	Authoritative Father	500	30.2380	9.30	-0.230**
12	Authoritarian Father	500	29.2200	9.24	0.200**
13	Permissive Father	500	26.4120	9.15	0.086
14	Self Esteem	500	15.1560	5.69	-0.151**
15	Loneliness	500	23.9640	12.8	0.236**
16	Executive Functions	500	0.571	0.134	-0.092*
17	Cognitive Reappraisal	500	20.2500	6.19	-0.062
18	Expressive Suppression	500	16.3620	5.38	0.203**
19	BehaviouralSocial Avoidance	500	35.1040	13.60	0.122**
20	BehaviouralNon-Social Avoidance	500	14.4040	5.59	0.119**
21	Cognitive Social Avoidance	500	22.3940	8.89	0.106**
22	CognitiveNon-Social Avoidance	500	13.8340	5.78	0.087

*Note: *p=<.05, **p=<.001*

Carl Pearson's product-moment correlation was used to understand the relationship between psychosocial factors (stress, anxiety, depression, perceived social support from significant other, perceived social support from family, perceived social support from friends, social connectedness, perceived authoritative, authoritarian and permissive parenting from mother, perceived authoritative, authoritarian and permissive parenting from father, self-esteem, loneliness, cognitive

reappraisal, expressive suppression, behavioural, social avoidance, behavioural nonsocial avoidance, cognitive, social avoidance, cognitive nonsocial avoidance), executive functions and problematic internet use.

The results of the correlation table indicate a significant positive correlation between stress, anxiety, depression and problematic internet use, and this relationship was significant at 0.01 level (r=.263, .210 and .268, p<.001, N=500). When connecting the relationship between perceived authoritarian parenting from the mother and problematic internet use, there was a significant positive correlation between problematic internet use and authoritarian parenting from the mother (r= .221, p<.001, N=500). There was a significant negative correlation between problematic internet use and perceived authoritative parenting from the mother (r=-.213, p < 0.05, N=500). The same kind of relationship was found between perceived parenting from the father. There was a significant positive correlation between perceived authoritarian parenting from the father and problematic internet use (r= .200, p<.001, N=500) and a significant negative correlation between perceived authoritative parenting from the father and problematic internet use (r= -.230, p<.001, N=500). The study also found a significant negative correlation between self-esteem and problematic internet use (r=-.151, p<.001, N= 500) and the study found a significant positive correlation between loneliness and problematic internet use (r = 0.236, p < 0.001, N = 500). A significant negative correlation exists between problematic internet use and executive functions (r=-.092, p<.05, N=500). The study also found that among subdomains of emotion regulation, such as cognitive reappraisal and expressive suppression, cognitive reappraisal has a significant negative correlation with problematic internet use (r=-.062, p<.001, N= 500). There

was a significant positive correlation between expressive suppression and problematic internet use (r= .203, p<.001, N=500). The table also shows that some of the following variables do not have a significant relationship with problematic internet use. The perceived support from significant other(r= .03, p > 0.05, N=500), perceived support from family(r= .04, p > 0.05, N=500), perceived support from friends(r= .045, p > 0.05, N=500), social connectedness(r= .082, p > 0.05, N=500), perceived permissive parenting from mother(r= .01, p > 0.05, N=500), perceived permissive parenting from father(r=.086, p > 0.05, N=500), cognitive reappraisal(r=-.062, p > 0.05, N=500), cognitive non-social avoidance (r=.087, p > 0.05, N=500) and problematic internet use.

H_2: Psychosocial factors and executive functions will significantly predict problematic internet use among youth.

Table 3

Stepwise Regression Results of Problematic Internet Use

Variable	***B***	**95% CI**		**SEB**	**B**	R^2	ΔR^2
		LL	**UL**				
Step 1						0.072	.072**
Constant	29.156	27.99	30.31	0.589			
Depression	0.502	0.343	0.661	0.081	0.268		
Step 2						0.115	.043**
Constant	23.53	21.01	26.06	1.283			
Depression	0.482	0.36	0.638	0.079	0.257		
Authoritarian M	0.212	0.127	0.297	0.043	0.207		
Step 3						0.143	.028**
Constant	19.68	16.56	22.79	1.586			
Depression	0.437	0.282	0.592	0.079	0.233		
Authoritarian M	0.213	0.129	0.296	0.043	0.208		

Variable	*B*	95% CI		SEB	B	R^2	ΔR^2
		LL	UL				
Expressive Suppression	0.251	0.128	0.374	0.062	0.169		
Step 4						0.164	.021**
Constant	24.76	20.596	28.941	2.124			
Depression	0.406	0.252	0.561	0.078	0.217		
Authoritarian Mother	0.187	0.103	0.27	0.043	0.182		
Expressive Suppression	0.226	0.104	0.348	0.062	0.152		
Authoritative Father	-0.13	-0.202	-0.058	0.037	-0.15		
Step 5						0.178	.014**
Constant	23.490	19.260	27.720	2.153			
Depression	.342	.183	.501	.081	.182		
Authoritarian Mother	.191	.108	.274	.042	.187		
Expressive Suppression	.186	.062	.310	.063	.125		
Authoritative Father	-.121	-.192	-.049	.036	-.139		
Loneliness	.080	.026	.134	.027	.129		
Step 6						0.191	.013**
Constant	21.863	17.513	26.214	2.214			
Depression	.345	.187	.503	.080	.184		
Authoritarian Mother	.183	.100	.266	.042	.179		
Expressive Suppression	.184	.060	.307	.063	.124		
Authoritative Father	-.121	-.192	-.049	.036	-.139		
Loneliness	.078	.025	.132	.027	.126		
Daily Use	.286	.087	.486	.101	.115		
Step 7						0.202	.011**
Constant	20.918	16.537	25.299	2.230			
Depression	.201	.012	.391	.097	.107		
Authoritarian Mother	.183	.100	.265	.042	.179		
Expressive Suppression	.185	.062	.307	.062	.124		
Authoritative Father	-.112	-.184	-.041	.036	-.130		
Loneliness	.074	.020	.127	.027	.119		
Daily Use	.294	.095	.492	.101	.118		

Variable	*B*	95% CI		SEB	B	R^2	ΔR^2
		LL	UL				
Stress	.237	.061	.412	.089	.134		
Step 8						0.21	0.007**
Constant	16.630	10.712	22.547	3.012			
Depression	.192	.003	.382	.096	.103		
Authoritarian Mother	.187	.104	.269	.042	.183		
Expressive Suppression	.179	.057	.301	.062	.121		
Authoritative Father	-.111	-.182	-.041	.036	-.129		
Loneliness	.075	.022	.128	.027	.121		
Daily Use	.298	.101	.496	.101	.119		
Stress	.243	.068	.418	.089	.137		
Social Connectedness	.065	.004	.126	.031	.085		

A stepwise regression was conducted to evaluate whether various psychosocial factors, executive functions and patterns of internet use predict problematic internet use among youth. It is observed in Table 2 that from these psychosocial factors, executive functions and patterns of internet use, only eight variables, which are depression, perceived authoritarian parenting from mother, expressive suppression, perceived authoritative parenting from father, loneliness, daily use hours of internet, stress and social connectedness where upheld as significant predictors that in combination contributed significantly to problematic internet use among youth.

In step 1, the R^2 value of .072 revealed that the depression explained a 7.2% variance in problematic internet use with F (1, 498) =38.508, p<0.001. The findings revealed that depression positively predicts problematic internet use (β =.268,

p<0.001). This reveals that a person who has depressive features is more likely to develop problematic internet use.

In step 2, the R^2 value of .115 revealed that the depression and perceived authoritarian parenting from the mother explained an 11.5% variance in the problematic internet use with F (2, 497) =32.147, p<0.001. The findings revealed that depression (β =.257, p< 0.001) and perceived authoritarian parenting from the mother (β =.207, p<0.001) positively predict problematic internet use.

In step 3, the R^2 value of .143 revealed that the depression, perceived authoritarian parenting from the mother, and expressive suppression explained a 14.3% variance in the problematic internet use with F (3, 496) =27.479, p<0.001. The findings revealed that depression (β =.233, p< 0.001), perceived authoritarian parenting from the mother (β =.208, p< 0.001), and expressive suppression (β =.169, p< 0.001) positively predict problematic internet use.

In step 4, The R^2 value of .164 revealed that depression, perceived authoritarian parenting from the mother, expressive suppression and perceived authoritative parenting from the father explained a 16.4% variance in the problematic internet use with F (4, 495) =24.244, p<0.001. The findings revealed that depression (β =.217, p< 0.001), perceived authoritarian parenting from the mother (β =.182, p< 0.001), and expressive suppression (β =.152, p< 0.001) will positively predict problematic internet use. The perceived authoritative parenting from the father (β =-0.15, p< 0.001) will negatively predict problematic internet use.

Step 5, the R^2 value of .178 revealed that depression, perceived authoritarian parenting from the mother, expressive suppression, decreased perceived authoritative parenting from the father, and loneliness explained a 17.8% variance in the

problematic internet use with F (5, 494) =21.382, p<0.001. The findings revealed that depression (β =.182, p< 0.001), authoritarian parenting from the mother (β =.187, p< 0.001), expressive suppression (β =.125, p< 0.001), and loneliness (β =.129, p< 0.001) positively predict problematic internet use and perceived authoritative parenting from the father (β =-.139, p< 0.001) negatively predicts problematic internet use. While these factors alone may increase the risk, their combined impact can be more significant.

Step 6, the R^2 value of .191 revealed that depression, perceived authoritarian parenting from the mother, expressive suppression, perceived authoritative parenting from the father, loneliness, and increased daily internet use explained a 19.1% variance in problematic internet use with F (6, 493) =19.400, p<0.001. The findings revealed that depression (β =.184, p< 0.001), authoritarian parenting from the mother (β =.179, p< 0.001), expressive suppression (β =.124, p< 0.001), loneliness (β =.126, p< 0.001), and increased daily internet use (β =.115, p< 0.001) positively predict problematic internet use. The perceived authoritative parenting from the father (β =-.139, p< 0.001) negatively predicts problematic internet use. The risk of problematic internet use is increased by depression, perceived authoritarian parenting from the mother, expressive suppression, loneliness, and decreased authoritative parenting from the father. It is also increased by increased daily internet use due to various online activities and distractions.

Step 7, the R^2 value of .202 revealed that depression, perceived authoritarian parenting from the mother, expressive suppression, perceived authoritative parenting from the father, loneliness, increased daily internet use and stress explained a 20.2% variance in problematic internet use with F (7, 492) =17.834, p<0.001. The result

revealed that depression (β =.107, p< 0.001), perceived authoritarian parenting from the mother (β =.179, p< 0.001), expressive suppression (β =.124, p< 0.001), loneliness (β =.119, p< 0.001), increased daily internet use (β =.118, p< 0.001), and stress (β =.134, p< 0.001) would predict problematic internet use. The perceived authoritative parenting from the father (β =-.130, p< 0.001) will negatively predict problematic internet use.

Step 8, the R^2 value of .210 revealed that depression, perceived authoritarian parenting from the mother, expressive suppression, perceived authoritative parenting from the father, loneliness, increased daily internet use, stress and social connectedness explained a 21% variance in problematic internet use with F (8, 491) =16.270, p<0.001. The result revealed that depression (β =.103, p< 0.001), perceived authoritarian parenting from the mother (β =.183, p< 0.001), expressive suppression (β =.121, p< 0.001), loneliness (β =.121, p< 0.001), increased daily internet use (β =.119, p< 0.001), stress (β =.137, p< 0.001) and social connectedness (β =.085, p< 0.001) would predict problematic internet use. The perceived authoritative parenting from the father (β =-.129, p< 0.001) will negatively predict problematic internet use.

H_3 The Structural Equation Model will explain the problematic internet use among youth.

Figure 1

Proposed Structural Equation Model for Problematic Internet Usage

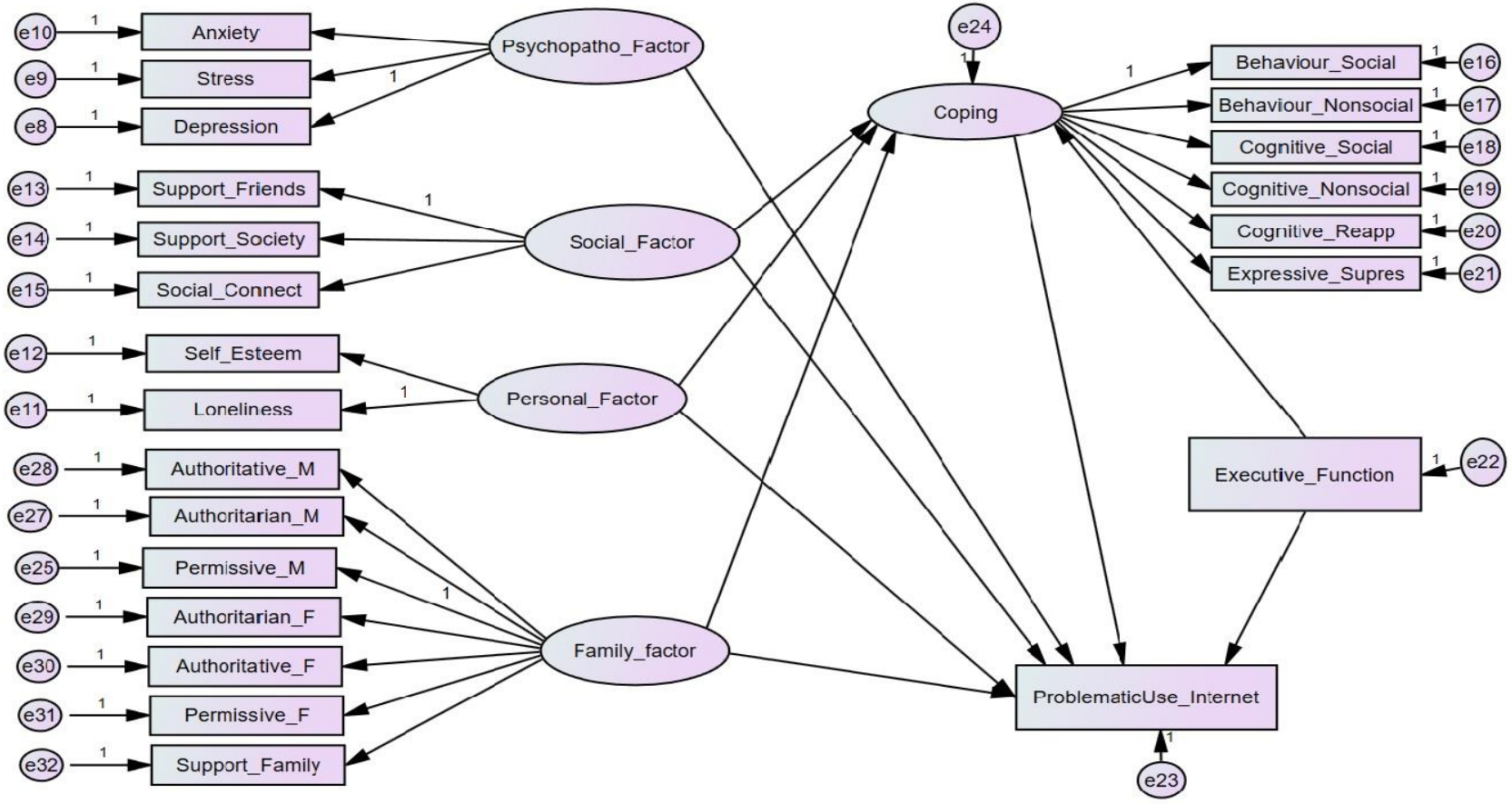


Table 4

Assessment for model goodness of fit

RMSEA	CFI	TLI	GFI	PNFI	RMR	NFI
0.0608	0.846	0.902	0.905	0.556	0.0732	0.717

The table summarises various fit indices commonly used in Structural Equation Modelling (SEM). These fit indices are crucial in assessing how well a proposed model aligns with the empirical data. Among the key fit indices discussed, the Root Mean Square Error of Approximation (RMSEA) indicates the degree of discrepancy between the proposed model and the empirical data. A lower RMSEA value, precisely 0.0608 in this context, indicates a superior model fit. Generally, RMSEA values below 0.08 indicate a favourable fit, suggesting that the model is a reasonable representation of the observed data. The Comparative Fit Index (CFI) evaluates suitability by contrasting it with a baseline, typically a null model. In this case, a CFI value of 0.846 suggests that the specified model outperforms a null model but does not attain an outstanding level of fit. Values closer to 1, notably exceeding 0.90, are regarded as indicative of a satisfactory model fit.

Similarly, the Tucker-Lewis Index (TLI) compares the specified model's fit against that of a null model. A TLI value of 0.902 signifies an acceptable level of model fit, albeit with some potential for refinement. Values approximating 1, notably surpassing 0.90, suggest a well-fitting model. The Goodness of Fit Index (GFI) evaluates the model's ability to reproduce the sample data effectively. A GFI value of 0.905 implies a model fit that can be good, with values surpassing 0.90 generally considered satisfactory.

The Parsimonious Normed Fit Index (PNFI) gauges the model's parsimony. A PNFI value of 0.556 indicates a level of model parsimony, although it may benefit from some simplification. The Root Mean Square Residual (RMR) quantifies the average residual, representing the variance between observed and predicted values within the model. A lower RMR value, such as 0.0732, signifies a favourable model fit. The Normed Fit Index (NFI) is another index that assesses the overall goodness of fit, akin to the GFI. The NFI value of 0.717 suggests an acceptable level of fit, although there remains potential for improvement.

The interpretation of the presented fit indices indicates that lower values of RMSEA and RMR, coupled with higher CFI, TLI, GFI, PNFI, and NFI, generally denote a superior fit of the model. Given that RMSEA is less than 0.07, RMR is below 0.08, PNFI is less than 0.6, and GFI exceeds 0.90, along with a TLI surpassing 0.90, the overall structural equation model can be considered to fit well with the empirical data.

The following diagrammatic representation of the model may enhance the comprehensibility of the factors influencing individuals' avoidance of coping strategies and problematic internet use within this research.

Table 5

Measurement model parameters, standard error, and p-value of test for significance of item scale

Items (observed variable) (total score)		**Factor**	**Estimate**	**S.E.**	**P**	**Conclusion**
Depression	<---	Psychopatho_Factor	1			

Items (observed variable) (total score)		Factor	Estimate	S.E.	P	Conclusion
Stress	<---	Psychopatho_Factor	1.188	0.081	0.001	Significant
Anxiety	<---	Psychopatho_Factor	1.044	0.072	0.001	Significant
Loneliness	<---	Personal_Factor	1			
Self Esteem	<---	Personal_Factor	-0.118	0.052	0.024	Significant
Perceived Support from Friends	<---	Social_Factor	1			
Perceived Support from Society	<---	Social_Factor	0.455	0.173	0.008	Significant
Social Connectedness	<---	Social_Factor	0.02	0.046	0.663	In significant
Behaviour Social Avoidance Behaviour	<---	Coping	1			
Nonsocial Avoidance	<---	Coping	0.631	0.019	<0.001	Significant
Cognitive Social Avoidance	<---	Coping	0.793	0.021	<0.001	Significant
Cognitive Nonsocial Avoidance	<---	Coping	0.954	0.024	<0.001	Significant

Items (observed variable) (total score)		Factor	Estimate	S.E.	P	Conclusion
Cognitive Reappraisal	<---	Coping	-0.105	0.042	<0.001	Significant
Expressive Suppression	<---	Coping	0.12	0.031	<0.001	Significant
Permissive_M	<---	Family_ Factor	1			
Authoritative_M	<---	Family_ Factor	-0.3	0.048	<0.001	Significant
Authoritarian_M	<---	Family_ Factor	-0.273	0.052	<0.001	Significant
Authoritative_F	<---	Family_ Factor	-0.245	0.046	<0.001	Significant
Authoritarian_F	<---	Family_ Factor	-0.234	0.047	<0.001	Significant
Permissive_F	<---	Family_ Factor	0.801	0.067	<0.001	Significant
Support_Family	<---	Family_ Factor	-0.134	0.08	0.093	In Significant

**Level of significance= 0.05*

The above table comprehensively assesses the statistical significance of various item scales concerning their respective latent variables, including avoidance copying, social factors, personal and family factors, and psychopathological factors. This examination underscores the validity of each measurement model, thus establishing its suitability for subsequent analytical procedures. The table features essential parameters such as point estimates, standard errors (S.E.), p-values, and results concerning these associations' statistical significance. The observed variables or items are inherently affiliated with specific latent factors. For instance, items such

as "Depression," "Stress," and "Anxiety" are indicative of variables that are aligned with the "Psychopathological Factor". The "Factor" column within the table elucidates the latent constructs encompassed by the measurement model, exemplified by the "Psychopathological Factor" as a latent construct underlying the study.

The "Estimate" component provides the path coefficients, which quantify the strength and direction of the relationship between each observed variable and the latent factor it represents. An estimate of "1" indicates a perfect, unmediated association, while other estimates convey the extent of the relationship.

The Standard Error is instrumental in assessing the precision and reliability of the estimated coefficients. Smaller standard errors signify more precise and dependable estimates.

The "P" column presents the p-values associated with each estimate. These p-values serve as crucial statistical indicators, offering insights into the significance level of the relationship between the observed variable and its corresponding latent factor. It is customary to employ a threshold of p-value less than 0.05 to determine statistical significance.

From the information presented in the table, the following conclusions can be drawn:

Stress, anxiety and depression are statistically significant variables in relation to psychopathological factors.

Self-esteem and loneliness are significant variables in relation to personal Factors.

Perceived support from friends and perceived support from society are statistically significant variables with social factors.

Behavioural non-social, cognitive social, cognitive non-social, and expressive suppression are statistically significant variables with respect to avoidance Coping. Perceived authoritarian parenting from mother, perceived authoritarian parenting from father, perceived authoritative parenting from mother, perceived authoritative parenting from father, and perceived permissive parenting from father are statistically significant variables associated with family factors.

These conclusions are grounded in the rigorous assessment of p-values and align with established conventions in the field. Items with p-values exceeding 0.05 are appropriately categorised as "Insignificant," indicating the absence of statistically significant associations in those cases.

Structural Equation Model for Problematic Internet Use

The table below gives the estimated path coefficients that minimise the difference between the observed and estimated model parameters. The model coefficients, corresponding standard errors, critical ratios, and p-values. Here, the estimated path coefficients represent the strength of connections, or the strength of the influence conveyed through that pathway.

Table 6

Estimated path coefficients, Standard error, and p-value.

		Factor	Estimate	S.E.	P	Conclusion
Avoidance Coping	<--	Social Factor	-0.084	0.0052	0.0105	Significant
Avoidance Coping	<--	Personal Factor	0.227	0.094	0.016	Significant

		Factor	Estimate	S.E.	P	Conclusion
Avoidance Coping	<--	Family Factor	0.067	0.098	0.495	In significant
Avoidance Coping	<--	Executive Function	-3.457	0.636	0.019	Significant
Problematic Internet Use	<--	Personal Factor	0.401	0.023	0.043	Significant
Problematic Internet Use	<--	Social Factor	0.08	0.054	0.137	In Significant
Problematic Internet Use	<--	Family Factor	0.049	0.101	0.627	In Significant
Problematic Internet Use	<--	Executive Function	-4.426	0.489	0.015	Significant
Problematic Internet Use	<--	Psychopathological Factor	0.289	0.0297	0.0331	Significant
Problematic Internet Use	<--	Avoidance Coping	0.022	0.014	0.037	Significant

This table presents the estimated path coefficients, standard errors, p-values, and conclusions for various relationships between the variables. These results provide insights into how different factors influence the outcome of interest.

Avoidance Coping and Social Factor

The estimated path coefficient (estimate) of -0.084 denotes that social factor influence avoidance coping. The standard error (S.E.) of 0.0052 reflects the precision of this

estimate. Notably, the low p-value of 0.0105 signifies statistical significance at the conventional 0.05 level, implying that social factor significantly influences avoidance coping.

Avoidance Coping and Personal Factor

A path coefficient of 0.227 is associated with the personal factors and their relationship with avoidance coping. The standard error of 0.094 quantifies the reliability of this estimate. Notably, the p-value of 0.016 attests to the statistical significance of this association, suggesting that personal factors play a significant role in affecting avoidance coping.

Avoidance Coping and Family Factor

Although the estimated path coefficient is 0.067, the relatively high p-value of 0.495 renders the relationship of family factor and avoidance coping statistically insignificant at 0.05. Thus, the family factor does not emerge as a substantial predictor of avoidance coping.

Avoidance Coping and Executive Function

The path coefficient of -3.457 signifies a substantial impact of executive function on avoidance coping. A low p-value of 0.019 reinforces the statistical significance of this association, underlining the considerable influence of executive function on avoidance coping.

Problematic Internet Use and Personal Factor

A path coefficient of 0.401 characterises that personal factors influence problematic internet use. The standard error of 0.023 enhances the precision of this estimate, and a p-value of 0.043 solidifies the conclusion of statistical significance. The personal factor is, therefore, a significant determinant of problematic internet use.

Problematic Internet Use and Social Factor

The estimated path coefficient of 0.08 shows that social factors influence problematic internet use. The p-value of 0.137 suggests that this relationship lacks statistical significance.

Problematic Internet Use and Family Factor

A path coefficient of 0.049 indicates that family factors influence problematic internet use. Nonetheless, the high p-value of 0.627 deems this association statistically insignificant.

Problematic Internet Use and Executive Function

A substantial negative influence of executive function on problematic internet use is evident from the path coefficient of -4.426. The low p-value of 0.015 reinforces the statistical significance of this relationship, emphasising the pronounced effect of executive function on problematic internet use.

Problematic Internet Use and Psychopathological Factor

The path coefficient of 0.289 reflects the significance of psychopathological factor in predicting problematic internet use. The p-value of 0.0331 further underscores the statistical importance of this relationship.

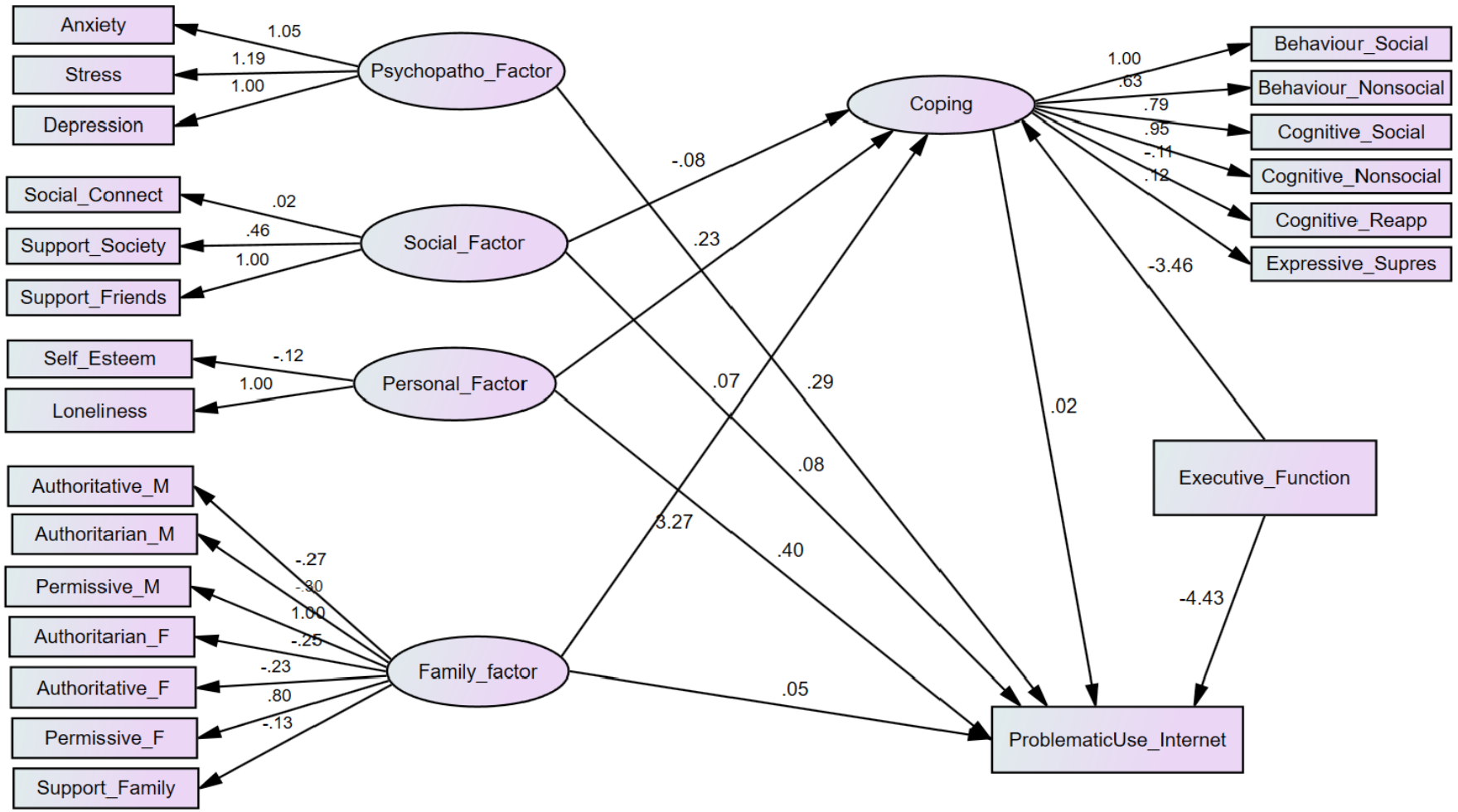
Problematic Internet Use and Avoidance Coping

A path coefficient of 0.022 is associated with the influence of avoidance coping on problematic internet use. With a p-value of 0.037, the statistical significance of this relationship is confirmed.

These findings shed light on the intricate interplay between these factors, coping strategies, and problematic internet use and is plotted in the following diagram.

Figure 2

Structural Equation Model for Problematic Internet Use



This structural equation model (SEM) investigates the interplay of various latent and observable variables, mainly focusing on the role of avoidance coping in the development of problematic internet use. The model includes latent variables such as psychopathological factors, social factors, personal factors, family factors, and avoidance coping, as well as observable variables related to each of these constructs. Additionally, executive functions are considered separate factors influencing problematic internet use and avoidance coping. The findings of the structural equation model (SEM) presented in this study shed light on the complex relationships among psychopathological factors, social factors, personal factors, family factors, avoidance coping, and executive functions in the context of problematic internet use. This discussion section will highlight critical implications and insights drawn from the results.

Psychopathological Factors and Problematic Internet Use

The latent variable psychopathological factors are reflected in observable variables such as anxiety, stress, and depression. These observable variables directly contribute to the latent variable, with path coefficients (β) of 1.05, 1.19, and 1, respectively. This latent variable, in turn, directly influences the development of problematic internet use (β = 0.29). Significantly, avoidance coping does not mediate the relationship between psychopathological factors and problematic internet use.

Social Factors and Problematic Internet Use

The latent variable social factors are reflected in observable variables related to perceived support from society, friends, and social connectedness, with path coefficients of 0.02, 0.46, and 1, respectively. This latent variable has a positive connection with the latent variable problematic internet use (β = 0.80), and the latent variable avoidance coping (β = -0.08) mediates this relationship. The latent variable avoidance coping contributed by the observable variables behavioural social avoidance (β = 1), behavioural non-social avoidance

(β = 0.63), cognitive social avoidance (β = 0.79), cognitive non-social avoidance (β = 0.95), cognitive reappraisal (β = -.11), and expressive suppression (β = 0.12).

Personal Factors and Problematic Internet Use

The latent variable of personal factors is driven by observable variables such as self-esteem (β = -0.12) and loneliness (β = 1). Both variables positively influence the development of problematic internet use (β = 0.23) and avoidance coping (β = 0.40). Significantly, this relationship is also mediated by the latent variable avoidance coping.

Family Factors and Problematic internet use

The latent variable of family factors is influenced by observable variables related to perceived authoritative, authoritarian, and permissive parenting from both the father and the mother, as well as perceived support from the family. These observable variables have path coefficients (-0.27, -0.80, 1, -0.25, -0.23, 0.80, and -0.13). The latent variable family factors positively influence the development of problematic internet use (β = 0.05) and avoidance coping (β = 0.07). Furthermore, avoidance coping is found to mediate this relationship.

Executive Functions as Protective Factors

Executive functions significantly negatively influence problematic internet use (β = -4.43) and avoidance coping (β = -3.46), indicating that individuals with better executive functions are less likely to develop problematic internet use.

Mediating role of Avoidance coping

The present study shows that avoidance coping has a mediating effect on the relationship between problematic internet use and psychosocial factors, and executive function is critically involved in this relationship.

SUMMARY AND CONCLUSION

Relationship between psychosocial factors and executive functions with problematic internet use

The Pearson product-moment correlation analysis revealed that Problematic Internet Use has significant positive correlation with Stress, Anxiety, Depression, and Perceived Authoritarian Parenting from both mother and father, Loneliness, Expressive Suppression, Behavioural Social Avoidance, Behavioural Non-social Avoidance, and Cognitive Social Avoidance with Problematic Internet Use. Conversely, Problematic Internet Use has a significant negative correlation was found with Perceived Authoritative Parenting from the mother and father, Executive Functions and Self-esteem.

Predictors of Problematic Internet use

Of the various Psycho-Social Factors and Executive Functions associated with Problematic Internet Use, only eight variables emerged as significant predictors. These variables include Depression, Perceived Authoritarian Parenting from the mother, Expressive Suppression, Perceived Authoritative Parenting from the father, Loneliness, Daily internet usage, Stress, and Social connectedness. 21% of the variance was indicated to explain the combination of variables in predicting Problematic Internet Use.

Working Model on Problematic Internet Use

An individual system will be collectively explained by Executive functioning and psychopathological, Personal, Social, and Family factors. When a person is faced with an adaptive/adjustive demand, such as Stress, an individual may seek immediate solutions. However, when unable to find a resolution, disequilibrium may develop, leading to maladaptive coping strategies, especially Avoidance Coping. The easy availability and the pleasurable nature of the internet, reinforce the Avoidance Coping behaviours, allowing the individual's system to attain temporary equilibrium. Within this relationship, Executive

function directly influenced problematic internet use. Likewise, the Avoidance Coping mediated the relationship with all other factors (Personal factors, Social factors, and Family factors) except for Psychopathological factors.

Tenability of Hypotheses

Based on various statistical analyses conducted, the hypotheses formulated for the study were re-examined to assess their validity. The following table presents the conclusions drawn from these analyses.

No.	**Hypotheses**	**Tenability of Hypotheses**
H_1	There will be a significant relationship between psychosocial factors, executive functions and problematic internet use among youth.	Substantiated the relationship with executive functions and some psychosocial variables such as stress, anxiety, depression, perceived authoritarian parenting from mother, perceived authoritarian parenting from father, loneliness, expressive suppression, behavioural social avoidance, behavioural non-social avoidance, cognitive social avoidance, perceived authoritative father, self-esteem, and perceived authoritative mother.
H_2	Psychosocial factors and executive functions will significantly predict problematic internet use among youth	Substantiated with respect to depression, perceived authoritarian parenting from

		the mother, expressive suppression, an authoritative father, loneliness, daily internet usage, stress, and social connectedness
H_3	The model will explain the problematic internet use among youths	Substantiated

5.11 Implications of the Study

- Recognising the interplay between psychosocial factors and executive functions can lead to more individualised treatment plans tailored to a person's specific needs and challenges.
- Understanding that perceived authoritarian parenting from the mother and the presence of a less authoritative father can influence problematic internet use highlights the importance of healthy family dynamics and parenting styles. This information can guide parents in creating supportive and balanced environments for their children.
- The connection between depression, loneliness, and stress with problematic internet use underscores the importance of addressing mental health and well-being in the context of excessive internet use. It emphasises the need for mental health support and stress management strategies.
- Understanding the role of social connectedness as a protective factor can encourage promoting healthy social relationships and building offline social support networks to counteract excessive online behaviour.
- The findings also underscore the need for public education and awareness campaigns about the potential risks of excessive internet use. These campaigns can help individuals,

especially adolescents and youths, better understand the implications of their online behaviours.

- A theoretical model helps identify and articulate the key factors and mechanisms contributing to problematic internet use. It provides a structured framework for understanding the relationships between psychosocial factors, executive functions, and other relevant variables. This deep understanding can guide further research and interventions.
- A well-developed theoretical model can enhance the predictive power of problematic internet use. Researchers and practitioners can use the model to anticipate which individuals are at higher risk and to what extent. This predictive ability can inform early intervention efforts.
- The model can guide the development of targeted interventions. By understanding the specific pathways leading to problematic internet use, interventions can be customised to address the unique needs of individuals.
- The model can help policymakers and regulators better grasp the dynamics of problematic internet use. It can inform the development of regulations, guidelines, and educational programs to promote healthier online behaviours.
- Healthcare professionals can use the model to assess and diagnose problematic internet use. It can serve as a reference for evaluating the role of psychosocial factors and executive functions in individual cases, leading to more accurate diagnoses and treatment plans.
- Theoretical models provide a roadmap for future research. They help identify gaps in knowledge and areas where further investigation is needed. Over time, this can lead to a more comprehensive and nuanced understanding of problematic internet use.

5.13 Limitations of the Study and Suggestions for Future Research

- The concepts of generalised and specific internet use are distinct, so the underlying causes for each may vary significantly. Therefore, conducting studies categorising internet use into these two dimensions and developing separate theoretical models can substantially enhance our comprehension of problematic internet use. This may help provide a more comprehensive understanding of problematic internet use's complexities, ultimately contributing to more effective prevention and intervention strategies.
- In order to comprehensively grasp the underlying causes of problematic internet use, it is imperative to conduct in-depth explorations into the realm of psychiatric comorbidities and their intricate connections to this phenomenon. This research avenue can elucidate the mechanisms and associations underlying the development and perpetuation of problematic internet use, providing invaluable insights for clinicians and researchers striving to develop effective interventions and preventive strategies.
- Incorporating neuroimaging studies with comprehensive neuropsychological assessments holds substantial promise for advancing our understanding of problematic internet use. By investigating the structural and functional aspects of the brain, coupled with detailed neuropsychological evaluations, researchers can differentiate patterns of brain activity, potential neurocognitive deficits, and the influence of these factors on the development and persistence of problematic internet use.
- A noteworthy limitation of the study lies in omitting several potential variables that could significantly influence the phenomenon under investigation. Notably, factors such as personality traits, intelligence level, psychopathological variables including attention-deficit/hyperactivity disorder (ADHD) and impulse control disorders, as well as familial influences encompassing parental and sibling behaviours, and even environmental variables linked to one's work environment, were not incorporated within the study's analytical framework. The absence of consideration for these multifaceted determinants

represents a limitation, as these unaddressed variables may exert considerable impact on the complex dynamics of the subject matter. Future research endeavours would benefit from comprehensively incorporating these variables to provide a more holistic understanding of the factors contributing to the phenomenon.

- While the present study utilised standardised tests, it is worth noting that the employment of specifically tailored tools developed for the study could yield a more comprehensive and nuanced understanding of the phenomenon under investigation. Therefore, future research could benefit from developing and integrating specialised tools, enhancing the depth and precision of the inquiry into the subject matter.
- The present study used self-report measures to understand the variables, including psychosocial factors and problematic internet use. Though many studies support using self-reported measures in psychology research, self-reported behaviour is not always the same as natural behaviour. It would be better if future studies try to understand the attributes using other approaches like qualitative enquiry.
- Focusing on the southern area of Kerala for a state-wide inquiry with a substantial sample size can improve the findings generalizability by allowing for a more detailed, context-specific exploration of the region's dynamics and unique characteristics. This approach optimises resource allocation, enhancing the study's statistical robustness. However, it is essential to note that findings may have limited applicability to the entire state, potentially missing regional differences in the northern and central areas.

This research may contribute significantly to future research, aiding in developing effective intervention and prevention plans and enhancing the understanding of internet use through neuro-psycho-social factors

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Paper Publications during the tenure (UGC CARE Listed Journals)

1. Babu, S., Premanand, V., & Ahnas, P. A. (2022). The Pattern of Problematic Internet Use during COVID-19 Lockdown. *Indian Journal of Psychology*, January 2022. (ISSN 0019-5553)
2. Saif, S., Babu, S., & Ahnas, P. A. (2023). Avoidance: A Predictor of Problematic Internet Use during COVID-19 Lockdown. *Indian Journal of Psychology*, January 2023. (ISSN 0019-5553)
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5. Babu, S., Premanand, V. (2024). Does daily internet use influence problematic internet use among youth? *Sanshodhak*, 2 (95). April 2024. (ISSN 2394-5990)

Paper Presentations during the tenure

1. Presented a paper on “Depression as a Predictor of Problematic Internet Use among Youth during COVID-19 Lockdown” in a seven-day International Multidisciplinary online conference on Recent Advancement in Varied fields from 6th to 11th February 2021, organised by Government College for Women (Autonomous), Mandya-571401, Karnataka, India.

2. Presented a paper on “Pattern of Problematic Internet Use during COVID-19 lockdown” in an International Virtual Conference Psychological Wellbeing in the Pandemic Era, on 6th and 7th August 2021, organised by IQAC Cell and Department of Psychology, Kateel Ashok Pai Memorial College, Kevempu University and Bharatiya Vidya Bhavan, Shimoga, Karnataka, India.
3. Presented a paper on the “Management of Problematic Internet Use among Youth” in an International Conference on Global Perspectives on Geriatric Care, on 28th to 30th March 2023, organised by Centre for Geriatric Studies, University of Kerala, Trivandrum, Kerala, India.
4. Presented a paper on “Does daily internet use influence problematic internet use among youth?” at an International Conference on the Impact of Changing Environment on Agriculture, Health, and Water Resources on 20th January 2024, organised by Shri Sant Damaji Mahavidyalaya, Maharashtra, India.